GEOKINETICS INC. shale oil development and production

582 north vernal avenue • p.o. box 889 • vernal, utah 84078 • telephone (801) 789-0806

September 15, 1980

Ron Daniels
Utah Division of Oil, Gas & Mining
1588 West North Temple
Salt Lake City, Utah 84116

Dear Mr. Daniels:

Geokinetics Inc. owns the oil shale mineral rights on Section 2, Township 14S, Range 22E, SLM, Uintah County, Utah. Under permit #ACT/047/002 issued by your office, we are currently operating in the NE 1/4 of the section.

We would like to extend our operation to the NW 1/4 of our section in order to develop the in situ process for a commercial size retort in an area of deeper overburden. As per your instructions, attached hereto is a copy of MR Form 1, MR Form 2, and a map showing the extent of the activity that we have planned on the NW 1/4 of Section 2.

Please contact us if you have any questions regarding this application. Thank you for your assistance and cooperation in this matter.

Sincerely,

Rusty Lundberg

Rusty Lundberg
Environmental Engineer

RL:rl

Enclosures

cc: Concord
Vernal
Kamp

MINING APPLICATION NO. _____

Date August 27, 1980

STATE OF UTAH
DEPARTMENT OF NATURAL RESOURCES
DIVISION OF OIL, GAS AND MINING
1588 West North Temple
Salt Lake City, Utah 84116

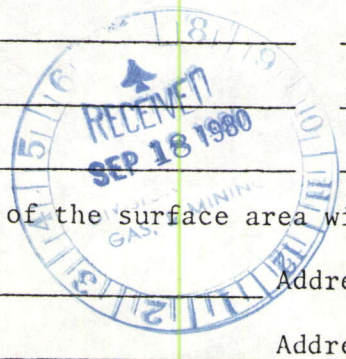
NOTICE OF INTENTION TO COMMENCE MINING OPERATIONS *
(See Rule M of General Rules and Regulations)

1. Name of Applicant or Company Geokinetics, Inc.
   Corporation (X) Partnership ( ) Individual ( )
2. Address 280 Buchanan Field Road, Concord, California 94520
   Permanent* Temporary
3. Name and title of person representing company Hilding K.L. Spradlin, Managing Environmental Engineer
4. Address P.O. Box 889, Vernal, Utah 84078 Office Phone (801) 353-4343
5. Location of Operation Uintah County Sec. 2 T. 14S R. 22E
6. Name of Mine Utah Experimental Site #1
7. Mineral to be mined:

( ) Coal	( ) Flagstone	Mining method:	
( ) Copper	( ) Gravel	In Situ Retorting	
( ) Manganese	(X) Shale		
( ) Iron Ore	( ) Uranium		
( ) Phosphate	( ) Gilsonite		
( ) Potash	( ) Bituminous Sandstone		
( ) Fluorspar	( ) Tungsten		
( ) Other (specify) _____			

8. Have you or any person, partnership or corporation associated with you received an approved Notice of Intention to Commence Mining Operations by the State of Utah for operations other than described herein?
   (X) Yes ( ) No
   If yes, list all approval numbers now under surety:

   ACT/047/002



9. Owner/Owners of record of the surface area within the land to be affected:

   State of Utah Address _____

   _____ Address _____

   _____ Address _____

   _____ Address _____

*Operation does not involve mining. Experimental work on an in situ process is planned.

10. Owner/Owners of record of minerals to be mined:

State of Utah	Address	
Geokinetics, Inc., Lessee	Address	280 Buchanan Field Road Concord, California 94520
	Address	
	Address	

11. Owner/Owners of record of all other minerals within any part of the land affected:

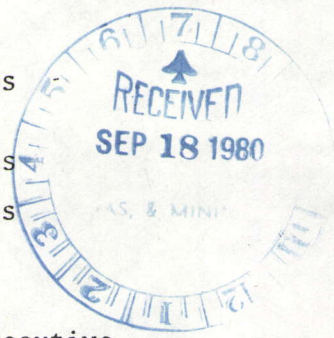
None	Address	
	Address	
	Address	

11a. Have the above owners been notified in writing?
(X) Yes ( ) No

12. Source of Operator's legal right to enter and conduct operations on land to be covered by the Notice State of Utah Oil Shale Lease #ML 24276A

13. Approximate acreage to be disturbed:

A)	Mining Operation Area - (include operations, storage, & disposal area)	12 acres
B)	Access Road or Haulageway -	Approx. 1 acres
C)	Drainage System -	acres
	TOTAL ACRES:	13



14. Give the names and post office addresses of every principal Executive, Officer, Partner, (or person performing a similar function) of Applicant:

	Name:	Title:	Address:
a.	Mitchell A. Lekas	President	280 Buchanan Field Road Concord, CA 94520
b.	John D. Downen	Vice-President	280 Buchanan Field Road Concord, CA 94520
c.	Henry H. Patton	Treasurer	Orchard Road Skillman, NJ 08568
d.	Robert D. Mackenzie	Secretary	One Maritime Plaza San Francisco, CA 94111

15. Has Applicant, any subsidiary or affiliate or any person, partnership, association, trust, or corporation controlled by or under common control with Applicant, or any person required to be identified by Item 14, ever had an approval of a Notice of Intention withdrawn or has surety relating thereto ever been forfeited? ( ) Yes (X) No

If yes, explain:

STATE OF Utah

COUNTY OF Uintah

I, Hilding K.L. Spradlin, having been duly sworn depose and attest that all of the representations contained in the foregoing application are true to the best of my knowledge; that I am authorized to complete and file this application on behalf of the Applicant and this application has been executed as required by law.

Signed: Hilding K.L. Spradlin

Taken, subscribed and sworn to before me the undersigned authority in my said county, this 17th day of September, 1980.

Notary Public: Sherry Wells

My Commission Expires: 3-7-82

PLEASE NOTE:

Section 40-8-13(2) of the Mined Land Reclamation Act provides as follows:

> "Information relating to the location, size, or nature of the deposit and marked confidential by the operator, shall be protected as confidential information by the Board and the Division and not be a matter of public record in the absence of a written release from the operator, or until the mining operation has been terminated as provided in subsection (2) of section 40-8-21."

Is confidential information contained herein?

YES _____ (Initial)

NO X (Initial)

Sections desired to be maintained as confidential information -

_____ _____ _____

_____ _____ _____

_____ _____ _____

RECEIVED SEP 18 1980

MRA FORM 2
Page 1 of 3

MINING APPLICATION *
NO. _____

Date: Sept. 15, 1980

STATE OF UTAH
DEPARTMENT OF NATURAL RESOURCES
DIVISION OF OIL, GAS AND MINING
1588 West North Temple
Salt Lake City, Utah 84116

MINING AND RECLAMATION PLAN

1. Name of Applicant or Company Geokinetics Inc.

2. Proposed type of operation In Situ Oil Shale Retorting

3. (a) Prior Land Use(s) Grazing

   (b) Current Land Use(s) Grazing

   (c) Possible or Potential Future Land Use(s) Grazing

4. What vegetation exists on the land proposed to be affected Sage-brush, sparse range grass and scattered small bushes and trees.

   (a) Percent Cover 70%

5. What is the average pH of soil before mining? 8.0 to 8.5 pH, What is the average pH of soil of proposed disposal area? - pH

   Name of person or agency and method of determining pH Dr. Erik R. Olgeirson of ERO Associates, Consulting Ecologists by saturated Paste Method.

6. Site elevation above sea level approximately 6700'

7. In case of coal, oil shale, and bituminous sandstone:

   Principal seam(s) and thickness(es) Mahogany - Approximately 30'

8. Estimated duration of mining operations Research and development program operational until December 31, 1982.

9. Has overburden and/or minerals mined or proposed to be mined been classified as acid or alkali producing? ( ) Yes (X) No
   Does the material being moved have any characteristics affecting revegetation? No

10. Will any underground workings be encountered? ( ) Yes (X) No.

    Is there an active discharge from abandoned deep mines on the proposed area of operation? ( ) Yes (X) No If yes, describe the quality of water being discharged _____.

11. Describe specifically a detailed procedure for: (Attachments, drawings, or supplements 8 1/2" x 11" sheets)

a. The mining sequence.
b. A procedure for constructing and maintaining access roads, to include a typical cross-section and a profile of the proposed road grades.
c. A procedure for site preparation to include removing and disposing of trees and brush.
d. A method for removing and stockpiling topsoil or disturbed materials.
e. A method for the placement of containment of all disturbed materials, to include the method for handling of all acid or alkali-producing and toxic material.
f. A procedure for final stabilization of disturbed materials.

GRADING

Specifically describe:

a. Typical cross-section of regrading.
b. The method of spreading topsoil or upper horizon material on the regraded area and indicate the approximate thickness of the final surfacing material.
c. What type of soil treatment will be utilized.
d. The method of drainage control for the final regraded area.
e. Maximum grading slope.

TESTING

1. Describe method for testing soil Saturated Paste - performed by ERO Associates, Consulting Ecologists

2. Describe treatment to neutralize or otherwise condition soil to support a vegetative cover. Soil will remain in place and should not need conditioning.

3. Describe preparation of areas intended to support revegetation - Bench or terrace: All disturbed surfaces will be prepared for revegetation in accordance with the Landscape and Erosion Control Plan. (A copy of this plan was sent to the Division of Oil, Gas and Mining in 1979).
Outslope: An example of such site preparation was presented in the MR Form 3 submitted by Geokinetics for 1979.

REVEGETATION

1. Revegetation to be completed by:
   - (X) Operator
   - ( ) Soil Conservation District
   - ( ) Private Contractor
   - ( ) Hydroseeding
   - ( ) Aerial Seeding
   - ( ) Conventional or Rangeland Drilling Method

2. Mulch- to be developed as part of experimental program
   Type _____ Rate/Acre _____ lbs.

3. Revegetation plan and schedule - A joint revegetation study with the U.S. Forest Service is presently being conducted at our field site. The objective of the study is to evaluate the survival and growth of 21 species (Table 1) established by transplanting container-grown planting stock. (Provided by Shrub Sciences Laboratory in Provo)

Species	Rate/ acre	Planting location	Facing N-S-E-W	Season to to be Replanted
Those species suitable for use in revegetating disturbed areas are listed in Table 2 attached to this form.				

4. Will affected area be subject to livestock or wildlife grazing:
   (X) Yes ( ) No. If yes, describe vegetation protection Any herbaceous vegetation removed during the project operation will be reclaimed. The list presented in Table 2 contains plant species that will sustain livestock or wildlife grazing.
5. Will irrigation be used? ( ) Yes (X) No Type _____
6. Describe maintenance procedures for revegetation if needed, until security release is granted See Landscape and Erosion Control Plan particularly Section 4.4

I, the undersigned operator, hereby submit this to be my reclamation and mining plan for the area shown on the attached map. I further understand that the operation will be conducted in accordance with the Mined Land Reclamation Act of 1975, and all rules and regulations currently in effect thereunder.

Signed Hildingt L. Spradlin Operator, Date Sept. 18, 1980

Taken, subscribed and sworn to before me the undersigned authority in my said county, this 18th day of September, 19 80.

Notary Public Sherry Wells

My Commission Expires: 3-7-82

SUPPLEMENTAL SHEET TO MRA FORM 2

11. a. Presently experimental work for the research and development program is being conducted and will continue to December 1, 1982. The commercial production sequence will be determined by the results of the research and development work.

b. Access road to retorts from existing dirt road will be an unimproved dirt road that will not be graded.

c. Site preparation will consist of removing only such brush that directly interferes with the actual operation of the retorts. Woody vegetation removed from the retort sites can be temporarily used to prevent erosion if necessary.

d. Topsoil will remain in place.

e. Effluent wastewater produced by the retorting process will be contained in an evaporation pond approved by the State Board of Health, Bureau of Water Quality.

f. All disturbed areas will be revegetated. Basic guidelines to be implemented in creating a vegetation cover suitable to deter erosion and provide forage for wildlife and domestic livestock are presented in the Landscape and Erosion Control Plan. (A copy was sent to the Division of Oil, Gas and Mining in 1979.)

TABLE 1

PLANT SPECIES IN FOREST SERVICE STUDY

Amelanchier utahensis

Chrysothamnus nauseosus

Ephedra viridis

Purshia tridentata

Quercus gambelli

Rhus trilobata

Achillea millefolium

Atriplex bonnevillensis

A. idahoensis

A. obovata

A. obovata[2]

A. tridentata

Camphorosma monspeliaca

Ceratoides lanata

Ceratoides papposa

Hedysarum boreale

Kochia prostrata var. villosissima

Oryzopsis hymenoides

Penstemon palmeri

Poa compressa

Swainsonia salsula

TABLE 2

SPECIES SUITABLE FOR USE IN REVEGETATING RETORTS AND OTHER DISTURBED SITES

COMMON NAME	SCIENTIFIC NAME
Grasses	
Bluebunch wheatgrass	Agropyron spicatum
Grama grass	Bouteloua gracilis
Green needlegrass	Stipa viridula
Indian ricegrass	Oryzopsis hymendordes
Intermediate wheatgrass	Agropyron intermedium
Pubescent wheatgrass	A. trichophorum
Russian wildrye	Elymus junceus
Western wheatgrass	Agropyron smithii
Forbs	
Arrowleaf balsamroot	Balsamorhiza saggitata
Globe mallow	Sphaeralcea coccinea
Utah fleabane	Erigeron utahensis
Utah sweetvetch	Hedysarum boreale
Shrubs and Half-Shrubs	
Big sagebrush	Artemisia tridentata
Green ephedera	Ephedera viridis
Little rabbitbrush	Chrysothamnus viscidiflorus
Mountain mahogany	Carcocarpus montanus
Pasture sage	Artemisia frigida
Rubber rabbitbrush	Chrysothamnus nauseosus
Saltbush	Artiplex canescens
Winter fat	Ceratoides lanata
Trees	
Pinyon pine	Pinus edulis
Utah juniper	Juniperus osteosperma

FIGURE 1
AFFECTED LANDS IN NW 1/4 OF SECTION 2